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SOVIET APPARATUS FOR INJECTING,
UNDER PRESSURE, ANESTHETIC INTO TISSUES

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In an article entitled "Handle Tip for Appliances to Be Used in Bringing About Anesthesia Under Pressure," Khirurgiya, No 12, 1947, pp 76-78, P. D. Kolchenogov, Candidate of Medical Science, inventor of the appliance discussed below, describes an apparatus consisting of a needle tip equipped with a large scissors-shaped handle which gives considerable leverage. The tip and handle assembly is connected by means of a rubber tube with a "bottle-ampule" filled with anesthetic solution. Compressing the handle opens the tip of the rubber tube and regulates the pressure of the solution forced through the needle. The solution is under pressure in the bottle-ampule. When the handle is released, the flow of liquid is shut off automatically.

Kolchenogov refers to a paper he wrote earlier, "Local Anesthesia From a Bottle-Ampule Under Raised Pressure," in Khirurgiya, No 7, 1945.

The following article discusses the use of apparatus for injecting an anesthetic under pressure into tissues.

A. V. Vishnevskiy's method of "creeping" infiltration with "hydraulic" preparation of the tissues to overcome pain during operations, although it practically replaced regional anesthesia and made almost complete replacement of total anesthesia with local anesthesia seem feasible, has the disadvantage that too much time is consumed in injecting the necessary large amount of the anesthetic at various depths.

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In the new Kolchenogov apparatus this large amount is ready for the surgeon's use. It operates on the principle of "atomization under pressure," is portable, and is of simple enough construction to make cheap manufacture possible. It is easily sterilized, simple to operate, and makes specially trained personnel unnecessary. Its main advantage is the excellent hydraulic preparation of the deep, otherwise inaccessible regions of the body and the great saving in time when it becomes necessary to inject large amounts of the solution.

Kolchenogov's method was used in about 400 operations: subtotal resections, complete extirpation of the stomach, and amputations. Among the patients were subjects weakened by cancer or in a condition of shock following trauma or profuse hemorrhages. The apparatus almost completely supplanted use of the hypodermic syringe during operations at our hospital.

Only a few minutes are needed for bringing about local anesthesia in minor operations, and between 10-12 minutes in serious ones. A pressure of 4 atm brings about, within a few seconds, an infiltration which, with the hypodermic needle, would have been time-consuming.

The operational field remains always dry. The anesthetic solution does not ooze out; a smaller quantity is used, which is important in major operations. One of the surgeon's hands remains free to separate the tissues. Asepsis is assured because the solution is at all times enclosed in a hermetically sealed container (the bottle ampule connected with the apparatus).

No complications have been reported after use of the apparatus; in fact, there has been a sharp reduction of postoperative suppuration and infiltration. In more than 400 test operations there were only two cases of pus formation, while in an equal number of operations during which hypodermics were used there were 12 such cases. The same ratio has persisted during the last 4 years.

The general sanitary preparations before all of the operations were the same. The conclusion is therefore inevitable that the Kolchanogov apparatus gives a better guarantee of asepsis than the hypodermic syringe.

The apparatus has been used successfully for mass parenteral injections of medicinal solutions. The nurse's only duty is to prepare the skin for the insertion of the needle and to insert it. The apparatus switches off automatically and no air can penetrate beneath the skin.

This new apparatus makes it possible for smaller medical institutions with only one nurse in attendance to improve their technique of local anesthesia and subcutaneous injection of medicinal solutions.

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